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AUTHOR Davila, Norma; Gomez, Manuel
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ABSTRACT

The objectives of this study were to: describe the model for dissemination developed and implemented in a Statewide Systemic Initiative based on partnerships between universities and schools, identify and describe contributing factors to the success and limitations of the dissemination strategy, discuss the relationship between the teachers' empowerment and their effectiveness as disseminators, compare the level of the professional development of the new teachers with that of the teachers in the pilot schools in terms of their capacity to implement the reform, and describe changes occurring in the teaching/learning culture of the second generation schools as a result of the whole-school interventions through the Regional Dissemination Centers and compare these with the changes at the first generation of schools. Results indicate that there was no significant difference in teacher empowerment or teaching practices between first and second generation teachers. It was concluded that in achieving systemic change it is necessary to conceptualize the nature of the change at a large scale and then begin implementation and testing at the pilot stage before scaling-up. Data collection protocols and questionnaires are included. (JRH)

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Evaluation of School-Based Regional Dissemination Centers as Scale-Up Mechanisms for Systemic Educational Reform in Science and Mathematics

Norma Dávila

University of Puerto Rico

Manuel Gómez

Puerto Rico Statewide Systemic Initiative

Paper presented at AERA Annual Meeting
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Abstract

An assisted-peer dissemination strategy was designed and implemented at a Statewide Systemic Initiative Program for educational reform in Science and Mathematics sponsored by the National Science Foundation. Its main features are: (1) partnerships between central and pilot school staffs; and (2) monitoring and self-correction mechanisms. Contributing factors to the success and limitations of the dissemination strategy were identified. The relationship between the teachers' empowerment and their effectiveness as disseminators was described. The levels of professional development of first and second generation teachers were compared; no significant differences in teacher empowerment or teaching practices were found between the groups. Changes in the teaching/learning culture of the second-generation schools as a result of the whole-school strategy were identified. Evidence was found that in achieving systemic change it is necessary to conceptualize the nature of change at a large scale and then begin implementation and testing at the pilot stage before scaling-up.

Evaluation of School-Based Regional Dissemination Centers as Scale-Up Mechanisms for Systemic Educational Reform in Science and Mathematics

The National Science Foundation (NSF) is sponsoring twenty-five Statewide Systemic Initiative (SSI) Programs. The Puerto Rico SSI promotes systemic change in education mainly by: (1) creating innovative curricula for the teaching of Science and Mathematics; (2) promoting equal access to educational opportunities in Science and Mathematics for students from diverse backgrounds; (3) establishing partnerships among key players at the local and state level; and (4) promoting the use of authentic assessment methods to measure student performance.

A major issue of systemic reform is whether effective mechanisms can be devised to scale-up the reform from the pilot to the dissemination stages (SRI International, 1995). This paper evaluates the strategy for the scale-up of the PR-SSI (grant no. OSR-9250052) based on regional dissemination centers located at former pilot schools where the dissemination is carried out by empowered teachers.

Importance of the Study:

An effective mechanism was designed to disseminate educational reform in Science and Mathematics for students from diverse backgrounds and to promote systemic change. The study provides evidence in support of school-based teacher-centered dissemination centers that can be effective in preserving quality in successive iterations of the dissemination process of the reform.

The study provides supporting evidence for: (1) the need for partnerships between universities and schools; (2) the key role of the empowered teacher as a change agent in any reform effort; (3) the importance of promoting and sustaining changes in the schools' teaching/learning culture through whole-school interventions; and (4) the need for built-in self-correction mechanisms to ensure the quality of any large-scale reform efforts. There is clear evidence of the need to conceptualize the nature of change at a large-scale and then to begin implementation and testing at the pilot stage before scaling-up.

Objectives:

The objectives of this study are to: (1) describe the model for dissemination developed and implemented in an SSI based on partnerships between universities and schools; (2) identify and describe contributing factors to the success and limitations of the dissemination strategy; (3) discuss the relationship between the teachers' empowerment and their effectiveness as disseminators; (4) compare the level of the professional development of the new teachers with the professional development of the teachers from the pilot schools in terms of their capacity to implement the reform; and (5) describe the changes ocurring in the teaching/learning culture of the second generation schools as a result of the whole-school interventions through the Regional Dissemination Centers and compare these with the changes at the first generation of schools.

Perspective:

The main goal of the studied SSI Program is "Science and

Mathematics for all students" thus expecting to provide high quality education in Science and Mathematics for students from diverse backgrounds. An innovative Science and Mathematics constructivist curriculum was designed to promote depth of understanding and higher-order thinking skills among intermediate school students based on the SS&C/NCTM/NRC philosophy. This curriculum was implemented in seven pilot intermediate public schools whose students and teachers represent the population of the Program's site in terms of geographical location and socio-economic background (Puerto Rico Statewide Systemic Initiative Annual Progress Report 1993-94, 1994).

A comprehensive evaluation plan was designed to measure the systemic impact promoted by the SSI Program. A key feature of this plan is the balance between the use of qualitative and quantitative methods to measure relevant systemic variables. (Puerto Rico Statewide Systemic Initiative Annual Evaluation Report 1993-94, 1994).

The implementation of the curriculum was closely monitored at the pilot schools to collect baseline data to: (1) design a model for its dissemination and (2) compare the performance of the pilot schools with the performance of the next generation of schools in the dissemination process. The results of the pilot testing of the reform in Science and Mathematics consistently showed high levels of achievement among students from all backgrounds as indicated by: (1) measurements of the affective, behavioral, and cognitive elements of attitudes based on the Questionnaire about Motivation

and Attitudes towards Science and Mathematics, an adaptation of the Motivated Strategies for Learning Questionnaire of Pintrich, Smith, García, and McKeachie (1991); (2) scores in pre and post tests designed by the Program's assessment staff (Puerto Rico Statewide Systemic Initiative Mid-Point Review Report, 1994); and (3) scores in an adaptation of the NAEP test used for calibration purposes (Puerto Rico Statewide Systemic Initiative Mid-Point Review Report, 1994). Preliminary results of the administration of the Student Empowerment Questionnaire also showed high levels of empowerment among students who are participating in the Program (Dávila, 1994).

Another major finding in the evaluation of the Program in the intermediate pilot schools was the high level of empowerment of the teachers who were implementing the curriculum as indicated initially by teacher interviews and confirmed later by the Teacher Empowerment Questionnaire (Dávila & Gómez, 1993). This finding was a key issue in the design of the model to transform the pilot schools into Regional Dissemination Centers through partnerships with teachers from other schools and with university faculty members.

The results of the evaluation showed clear evidence of changes in the teaching/learning culture of the schools. As the students' achievement and participation in the schools improved, the teachers' ownership and control of the teaching experience increased, and the directors' leadership and management styles changed, it was clear that the SSI pilot schools were very

different teaching-learning environments in 1993 than in 1991 and 1992 when they began to implement the curriculum (Puerto Rico Statewide Systemic Initiative Mid-Point Review Report, 1994). However, even though these changes in the teaching/learning culture of the schools were taking place at the pilot phase, the best strategy to promote and sustain similar changes in the second generation of schools required clearer planning.

Theoretical Framework:

The design, implementation, and evaluation of the Regional Dissemination Centers (RDC) follows the latest tendencies in the educational reform, professional development, teacher empowerment, and program scaling-up literature. The Centers offer a viable option for increasing the number of schools and participants reached by systemic reform efforts through whole-school interventions.

Little (1993) describes five streams of educational reform. One stream addresses subject matter teaching focusing on standards, curriculum, and pedagogy. Another stream focuses on problems of equity and achievement disparities while a third stream focuses on the nature, extent, and uses of student assessment. A fourth stream looks at the social organization of schooling. The fifth stream of educational reform is the professionalization of teaching, the favorite stream of policy makers according to Little (1993) because it is expected to contribute to form a solid and accountable workforce. With its focus on career opportunities in teaching, this stream is designed to prepare teachers to play a role in redefining

teaching and in training others. Thus, it acknowledges the key role of teachers in educational reform (Heller, 1993).

Professional enhancement of teachers is always a major issue in any educational reform since to change the system, one must change practice and to change practice one must change the practitioners (SRI International, 1995). Typically seen from the perspective of the individual, workshops, courses, and trainings (Loucks-Horsley, 1994; Sparks & Loucks-Horsley, 1989) are usually designed to give expertise to the teachers often increasing the number of hours dedicated to teacher preparation but still following traditional pedagogy and learning styles (Shanker, 1993). Thus, the traditional teaching paradigm is replicated even when, ironically, the intention is to foster change in teaching practices.

Sparks and Loucks-Horsley (1989) describe five models of staff development. Two of these models are specifically directed towards individual learning, another two are directed towards learning with others. The last model can be applied to either individual or group learning because inquiry can be done either individually or in cooperative groups as teachers learn to formulate valid questions.

In the individually-guided model, the teacher seeks what s/he needs to grow professionally. In the model based on observation and assessment, the teacher's reflections on his/her practice may be guided by visits from others who can be either peers or supervisors but who do not always address his/her particular needs or capacities. Among the models directed towards learning with

others, the authors describe one which promotes the teachers' involvement in projects of relevance to their fields or to their schools expecting that they will benefit from working on a task with other teachers. The model focused on training is based on the premise that the teachers can learn new behaviors and techniques and that they can implement these in the classroom.

Sparks and Loucks-Horsley (1989) emphasize the importance and value of the teachers as trainers of their peers, especially if the trainers have experience in the classroom and expertise in the particular area of interest. Popularly known as peer coaching, this model emphasizes the role of teachers in supporting and helping each another in their professional growth and offers a welcome change in the traditionally individualistic approach previously mentioned. Referring to the work of several authors, Sparks and Loucks-Horsley (1989) present several reasons why teachers may prefer learning from their peers: small groups, less expenses, feeling more comfortable expressing ideas, playing a more active role, and receiving more practical suggestions.

The current literature presents other alternative models to the traditional "give expertise to teachers" approach. Restructured schools where all their members are learners (Shanker, 1990) and communities of learners where teachers receive support over time (Loucks-Horsley, 1994) are two models which focus on the learning experiences of all the members of the school community. Both models underscore: (1) the importance of shared decision-making in the school; (2) the importance of the role of teachers as agents of

change; (3) the importance of inquiry in the teaching-learning process; and (4) the need for ongoing learning simultaneously focused on the individual and on the system. The restructured schools model also emphasizes the importance of the teachers' exposure to other subject areas as well as to integrating content, pedagogical theory, and practice into teaching. The communities of learners model highlights the importance of job-embedded training, long-term strategic planning, and student learning outcomes as well as content generic and content specific teaching skills.

Several authors have addressed the multiple elements that contribute to the success of professional development programs for teachers. Table 1 presents the main elements which have been discussed in the literature; among these are: (1) the importance given to professional development by administrators and other decision-makers; (2) the active participation and engagement of teachers in decision-making, goals, curricular development, classroom practice, and training; and (3) a collegial environment. These components are expected to promote a supportive environment for the teachers where they can become owners of their teaching experience or empowered within a changing school teaching/learning culture.

The literature lacks an agreement on a definition of what constitutes teacher empowerment even though many investigators have addressed this issue (e.g., Clark, 1992; Ferrara & Nepa, 1993; Heller, 1993; Lightfoot, 1985; Little, 1982; Miles, Saxl, & Lieberman, 1988; Monson & Monson, 1993; Short & Rinehart, 1992;

Raywid, 1993; Short & Rinehart, 1993). Autonomy, accountability, decision-making opportunities, collegiality and collaboration, mastery of content, professional development opportunities, self-assessment and institutional support have been identified consistently in the articles as components of this concept. According to several researchers (Clark, 1992; Dávila & Gómez, 1994; Little, 1982; Goldsmith & Nelson, 1991; Rappaport, 1987; Short & Rinehart, 1992), these issues must be investigated within the teachers' context because teacher empowerment is understood to be context-dependent.

The context where the educational reform efforts are taking place includes the attitudes, beliefs, values, expectations, knowledge, opportunities, and materials or the culture of the learning environment as defined in the sociological literature (Chinoy & Hewitt, 1975; Federico, 1975; Remmling & Campbell, 1970). Thus, one must look at the culture of the learning environment and at how it changes as a result of a cumulative process (Federico, 1975) and of transformations through time when studying educational reform.

Culture change is easier to generate and sustain at the school level when programs are implemented at a limited number of schools. However, reform efforts must reach large numbers of learning communities to really have an impact on education and this typically occurs after a pilot stage with a limited number of schools. The literature presents several examples of efforts to increase the number of learning communities being affected by

innovations (ATLAS, 1993; Bradley, 1992; Olson, 1993a; Olson, 1993b; Price, 1993; Richardson, 1993; Rothman, 1993). The literature lacks consensus in terms of what is the best strategy to scale-up any educational reform and the available research evidence about strategy effectiveness is extremely limited.

Little (1993) identified several issues of critical importance to be considered while designing scaling-up models: (1) complexity of tasks; (2) fit between reform models and professional development models; (3) lack of support for inquiry-based professional development; (4) inattention for opportunities to learn within the work year; (5) limited understanding of ongoing changes; (6) long-standing policy and results of past reforms; (7) pressure for fast-paced implementation; (8) problems with innovations when a traditional paradigm prevails; (9) limited resources and multiple players; (10) tendency to prefer standardized programs; and (11) political will. The last six issues are particularly relevant to systemic reform programs.

A major difficulty for the Statewide Systemic Initiatives (SSI) sponsored by the National Science Foundation (NSF) is the sustainability of the professional development efforts beyond the limits of the programs. Some other specific issues relate to: (1) inadequate long-term support for teachers; (2) little attention to preparing the next generation of teachers; and (3) lack of strategies to transfer to more sites (SRI International, 1995).

Because of a lack of specific proven strategies for effective scaling-up, the SSI states are experimenting with a variety of ways

to increase the number of sites and individuals impacted by their programs. SRI International (1995) refers to the use of teacher specialists affiliated with university-based regional centers in Kentucky and regional centers to meet the ongoing professional development needs of the teachers in Ohio. Michigan is enhancing the capacity of the professional development system aligning other services with the SSI while Nebraska is promoting distance learning by satellite and interactive videos. Delaware implemented demonstration sites where schools develop curriculum and assessment strategies and serve as models for other schools while SSI staff provide assistance. California involves all school staff members in professional development activities. New York focuses on eleven schools in the state six of which are located in urban centers. In contrast, Connecticut and Vermont are creating new non-profit institutions designed to be advocates for increasing the capacity of Science and Mathematics education even after the SSI ends.

For the PR-SSI, an assisted-peer dissemination strategy was designed to promote school-level teaching/learning culture changes in the second generation of participating schools. The model focuses on whole-school interventions and stems from the experiences with the first generation of participating schools or the pilot phase.

This strategy incorporates the components of successful professional development programs presented in Table 1 and closely resembles Shanker's (1990) restructured schools model and Loucks-Horsley's (1994) communities of learners model because it seeks the

active involvement of all the members of the educational community in the reform process. The strategy shares the university affiliation features of the Kentucky and Ohio SSI Programs and the model site feature of the Delaware SSI Program. It addresses most of the issues raised by Little (1993) particularly in terms of: (1) fit between reform and professional development models; (2) lack of opportunities to learn within the work year; (3) pressure for fast-paced implementation; and (4) limited resources and multiple players.

Description of the PR-SSI's Assisted-Peer Dissemination Strategy:

Three key features included in this model are: (1) partnerships between central staff (most of whom are university-based) and the empowered pilot school teachers serving as disseminators; (2) built-in external (i.e., SSI staff, Regional Dissemination Center coordinators, external evaluators) and self-correcting (i.e., communities of learners within the schools) mechanisms to achieve consistent levels of quality through successive generations of the dissemination process; and (3) mechanisms of assessment for quality control purposes.

Each Regional Dissemination Center is located at one of the seven intermediate former pilot schools. Each Center provides teacher training and technical assistance to between five and ten intermediate schools within its region with its empowered teachers as leaders and resources; this includes suggestions on alternative organizational and management structures. Figure 1 presents a graphic representation of a Regional Dissemination Center which

becomes a "Mini Educational Resource Center" within its region. Thus, each Regional Dissemination Center works with teachers within their own contexts.

The leadership of the SSI identified teachers from each school who had demonstrated high levels of leadership and empowerment within the school to lead the implementation of the regional dissemination efforts. These leaders or RDC Coordinators, received additional training on: (1) vision and philosophy of the PR-SSI; (2) making effective presentations; (3) preparing workplans; (4) developing leadership skills; (5) developing team-building skills; (6) becoming change agents; (7) documenting progress; and (8) evaluating presentations.

A plan was designed by the RDC Coordinators in collaboration with SSI staff members to reach and invite prospective intermediate schools to join the SSI on a voluntary basis. The plan included visits to schools within their regions, content and skills workshops, demonstrative classes at the prospective schools, meetings with Commonwealth Department of Education's personnel, meetings with Commonwealth Department of Education's regional staff, and formal presentations of the Program. To operationalize this plan, the Coordinators received full cooperation from the intermediate pilot school directors for whom educational reform and teacher preparation are high priorities.

Approximately 100 intermediate schools opted to join the SSI Program. The schools' directors and the totality of their Science and Mathematics teachers shared the decision to join the SSI and

agreed to: (1) implement the program in their schools as a whole school strategy and to prospectively serve as dissemination centers for the next generation in the dissemination process; and (2) facilitate the evaluation and monitoring process of the Program.

The schools were selected on the basis of their commitment and readiness for change. Sixty schools, representative of the system's diverse population with special emphasis on reaching schools with populations underrepresented in other reform efforts, were trained and began implementing the curriculum in the fall of 1994 following a sequential model beginning at the seventh grade level.

The second generation seventh grade teachers participated in four weeks of summer teacher enhancement activities organized by the RDC Coordinators in collaboration with the SSI staff. Teams of experienced intermediate level teachers in partnerships with university faculty members and high school teachers were brought together to lead these activities at each RDC under the direction of its coordinator. Prior to the Summer Teacher Enhancement Activities, the staff from each RDC participated in a "Trainer for Trainers Retreat" designed to strengthen their understanding of the background and expectations of the Program.

The Summer Teacher Enhancement Activities at the Centers were based on the format and structure of the summer teacher enhancement activities conducted by the curricular development and assessment staff in the pilot stage (i.e., university faculty members and experienced teachers). Figure 2 presents a direct comparison of the components of the first and second generation training centers with

the leadership, coaching, coordination of centers, and monitoring and evaluation of progress consistently provided by the SSI staff. This comparison illustrates how the resources at each RDC are equivalent to the resources at each original training center.

During four weeks, between thirty and forty second generation teachers at each RDC became familiar with the program, the curriculum, and their theoretical foundations. The teachers were exposed to the materials and resources available for them to implement the curriculum and learned about various teaching and assessment methods and strategies included in the curriculum such as inquiry. Demonstration and modelling of the practical curricular activities were major components of the Summer Teacher Enhancement Activities. The new teachers also experimented in classroom settings, reflected on their practices, and received constructive feedback in a supportive environment where collegiality was promoted. Eight school-year follow-up teacher enhancement activities follow a similar design.

While the RDC Coordinators and their staffs are mainly responsible for disseminating the reform, the SSI staff, which includes curricular development, assessment, and evaluation components, closely monitor changes occurring at the schools and offer to them support and assistance following the model presented in Figure 1. The RDC Coordinators and the SSI staff conduct follow-up visits to the schools to see the teachers in their classrooms for support and assistance and to meet with the directors to discuss issues such as flexibility in scheduling and school

organization.

The Coordinators and the SSI staff document changes in school teaching/learning culture in the second generation schools as a result of the whole-school strategy implemented through the Regional Dissemination Centers. Because this strategy was initially implemented and evaluated in the intermediate pilot schools, the SSI staff and the Coordinators can compare the changes occurring in the teaching/learning culture of both generations of schools.

The whole-school intervention strategy worked because of a multi-prong approach to transform the teaching/learning culture at the school level by: (1) empowering teachers, students, parents, and schools; (2) promoting shifts in paradigms; (3) fostering changes in attitudes; and (4) enhancing learning. The strategy consists of simultaneously providing to the schools: (1) an effective curriculum; (2) alternative assessment methods; (3) pertinent professional development; (4) low cost materials; (5) alternative management styles; and (6) supportive evaluation and monitoring so that the members of the schools can become communities of learners. It is the view of the SSI staff that all of the six thrusts must be done simultaneously in order to be successful in transforming the schools. Many attempts at changing teaching/learning school culture have failed because they have not involved all the teachers in the schools or because only some of the elements discussed above have been incorporated at any given time.

This model proposes an assisted-peer dissemination strategy

because it does not rely only on the teachers to conduct the dissemination. The strategy is designed to seek, nurture, and develop education reform leaders who can continue this effort beyond the limits of the SSI without losing the quality achieved and sustained throughout the pilot phase.

Research Questions:

The following research questions were formulated to guide this investigation:

(1) What are the contributing factors to the success and limitations of the assisted-peer dissemination strategy?

(2) What is the relationship between the teachers' empowerment and their effectiveness as disseminators?

(3) How does the professional development of the teachers from the first generation of schools compare with the professional development of the teachers from the second generation of schools in terms of their capacity to implement the reform?

(4) What changes are taking place in the teaching/learning culture of the second generation schools as a result of the whole-school reform strategy as promoted through the Regional Dissemination Centers and how do these schools compare with the first generation of schools?

Methods

Data Source:

Leaders of the Summer Teacher Enhancement Activities at the seven Regional Dissemination Centers, the coordinators of the Centers as well as a sample of the incoming seventh grade teachers provided data for this study. The information provided by the participants is part of the ongoing formative evaluation efforts of the SSI.

Participants:

Eight high school teachers and seven university faculty members who are involved in the ongoing teacher enhancement activities at the Regional Dissemination Centers participated in this study. Fifteen participated in semi-structured group interviews and eleven completed the Teacher Empowerment Questionnaire.

The seven coordinators of the Regional Dissemination Centers and fourteen experienced intermediate level teachers participated in the study in semi-structured group interviews. They completed the Teacher Empowerment Questionnaire in 1993.

Eighty incoming seventh grade Science and Mathematics teachers from the second generation schools participated in the study through semi-structured group interviews and thirty-five completed the Teacher Empowerment Questionnaire. One-hundred ninety-six teachers completed the Summer Workshop Evaluation Forms used to evaluate the Summer Teacher Enhancement Activities. Sixty teachers completed Follow-Up Workshop Evaluation Forms.

Twelve directors of second generation schools participated in the study through semi-structured individual interviews.

Measures, Instruments, and Procedure:

The Summer Workshop Evaluation Forms and Follow-Up Workshop Evaluation Forms allow the participants to rate the organization and logistics of the series of sessions or the individual workshop on a four-point scale: Outstanding = 4, Good = 3, Satisfactory = 2, and Poor = 1. The teachers rate specific components related to the content and strategies used in the series of sessions or the individual workshop on an agreement four-point scale: Very Much Agree = 4, Agree = 3, Disagree = 2, and Very Much Disagree = 1. Descriptive statistics are obtained for each item. Four open-ended questions addressing strengths and weaknesses of the sessions or series are also included; these are content analyzed for feedback purposes.

Semi-structured group interviews were conducted with: (1) a sample of the leaders of the Summer Teacher Enhancement Activities at the seven Regional Dissemination Centers (including high school teachers and university faculty) and (2) the coordinators of these Centers. The interviews addressed mainly their attitudes and concerns about the upcoming summer teacher enhancement activities, the changes in their vision of educational reform and of the SSI after their experience with the summer teacher enhancement activities; and their suggestions for improvement of the summer teacher enhancement activities and of the Traning for Trainers (see Appendix A for translated guide questions). The interviews were

conducted simultaneously by the evaluation staff using focus groups. The participants received the protocols at the beginning of the interviews to facilitate the discussion.

Semi-structured follow-up group interviews were conducted with incoming seventh-grade teachers from the second-generation schools. The interviews address mainly the ongoing changes at their schools as a result of their participation in the SSI, their satisfaction with the teacher enhancement activities, and their experiences with the RDC (see Appendix A for translated guide questions). To facilitate the discussion, the teachers received the protocol at the beginning of the interviews and were requested to identify their schools on their sheets and to respond to the first, second, and last areas in writing which directly address issues pertaining their particular schools. These interviews were conducted by the evaluation staff at the Regional Dissemination Centers after follow-up teacher enhancement activities.

Semi-structured individual interviews were conducted by the senior evaluation staff with directors of second-generation intermediate schools. The interviews mainly address their experiences implementing the new curriculum, the ongoing changes at their school as a result of the SSI, and their experience with the RDC (see Appendix A for translated guide questions).

The interviews were used to identify and describe the factors which contributed to the success and limitations of the implementation of this strategy in terms of: (1) the factors which contributed to the establishment of partnerships between junior and

senior high school teachers and university faculty; (2) the elements which contribute to the empowerment of the teachers who led the training activities; and (3) the effectiveness of built-in self-correction mechanisms. They were content analyzed.

Three main issues in the evaluation of the effectiveness of the dissemination model are the teachers': (1) mastery of content; (2) use of innovative teaching and assessment techniques; and (3) changes in the teaching/learning culture of the schools. These issues were evaluated by classroom visits conducted by the curricular development and assessment staff who are university recognized leaders in curricular transformations versed in the NCTM and NRC standards and outstanding Science and Mathematics teachers thus capable of objectively evaluating the teaching/learning environment of the schools.

The Classroom Observation Guidelines, an adaptation of the Classroom Observation Form (Winters, AERA, 1994) (see Appendix B for the translated version) was used in the classroom visits. The instrument was designed to facilitate the process of classroom visits by identifying specific areas of interest as part of the quality control efforts of the Program. It was used in classroom visits to nine Science and fourteen Mathematics second generation seventh grade teachers.

Various versions of the Classroom Observation Guidelines were produced and distributed among the curricular development and assessment staff for feedback and content validation purposes. Staff members were encouraged to interact freely with the teachers

and the students in the classrooms and to later write their reports based on their impressions and their discussions with the teachers of these impressions.

The teachers received copies of the instrument for self-assessment purposes. It is expected that the teachers will reflect on their teaching practices prior to the classroom visits so that they can fully benefit from the support and advice of the curricular development and assessment staff.

The data collected using the Classroom Observation Guidelines during visits to second generation seventh grade teachers was compared with data collected during visits to the first generation seventh grade teachers to assess their level of professional development and capacity to implement the reform.

The Teacher Empowerment Questionnaire (see Appendix B for translated items) (Dávila & Gómez, 1994), an adaptation of Short and Rinehart's (1993) School Participant Empowerment Scale, was designed to measure the teachers' level of empowerment. It contains forty-five statements with a four-point agreement scale: Very Much Agree = 4, Agree = 3, Disagree = 2, and Very Much Disagree = 1 for a maximum score of 180 (alpha coefficient = 0. 95). The questionnaire addresses issues related to the teachers' perceived opportunities for decision-making, professional development, status, self-efficacy, autonomy, and impact in their school environments whose items are grouped into sub-scales. The scores from the sub-scales were compared with the results of semi-structured interviews for validation purposes in 1993.

T-tests were performed to compare: (1) the level of empowerment of first and second generation seventh grade teachers; and (2) the level of empowerment of the leaders of the teacher enhancement activities with that of the first and second generation seventh grade teachers respectively.

Results

The teachers' satisfaction with the Summer Teacher Enhancement Activities was high across the Regional Dissemination Centers. Tables 2 and 3 present examples of the results of the teachers' evaluations of the organization and logistics aspects for Science and Mathematics. In both, Science and Mathematics, the items related to mastery of topic and participants' engagement received highest overall ratings while use of time received the lowest ratings.

Tables 4 and 5 present examples of the results of the evaluations of the content and strategies aspects for Science and Mathematics in the Summer Teacher Enhancement Activities. In both, the adequacy of the activities for concept development, the explanations of the instructors, the availability of the instructors, and the use of cooperative learning strategies received the highest ratings while the opportunities to develop assessment activities received the lowest ratings.

Tables 6 and 7 present the mean ratings of teachers' evaluations of follow-up professional enhancement activities at three Regional Dissemination Centers. Table 6 presents the results of the evaluation of the organization and logistics components while Table 7 presents the results of the concepts and strategies components. In Table 6, the instructors' clarity of expression and mastery of topic received the highest ratings while their use of time received the lowest ratings. In Table 7, the instructors' use of cooperative learning strategies and their availability to

clarify doubts received the highest ratings while the opportunities for integration of Science and Mathematics and to create assessment activities received the lowest.

The items from tables 2, 3, 4, 5, 6, and 7 which received the highest ratings reflect issues related to the empowerment of the leaders of the teacher enhancement activities.

Several main ideas emerged from the content analysis of the semi-structured interviews conducted with the university faculty members, high school teachers, experienced intermediate level teachers, and Regional Dissemination Center Coordinators. At first, all experienced a combination of apprehension, excitement, and tension as they prepared to begin the Summer Teacher Enhancement Activities. The RDC Coordinators were particularly concerned about their new managerial responsibilities and about the need to maintain the new teachers motivated. The experience of working with educators from different backgrounds was described as rewarding, exciting, enriching, and challenging; they admitted overcoming rank, philosophical, and training differences as they worked together as true supportive teams.

The participants have a better understanding of the PR-SSI and of the educational reform after working in the Program. They assessed their own needs for professional development as well as those of the second generation teachers especially in terms of assessment and cooperative learning strategies. The high school teachers and the university faculty members also developed a better understanding of many concepts and of integration of knowledge

across disciplines.

The analysis of the follow-up semi-structured interviews with the second generation teachers generated similar results for Science and Mathematics teachers. Their concerns are mostly in terms of physical plant and internal issues such as high enrollment and discipline problems, but they are also concerned about the impact of the Program on their students. The teachers request assistance with assessment activities, curricular activities, cooperative learning, research strategies, school organization, and parents' orientations. They also request a common class preparation period at their schools so that they can help each other and share with others their experience with the Program.

These new teachers are facing difficulties with finishing the curricular blocks, receiving their materials, preparing the materials, and meeting other teachers. They would like the students and teachers guides revised based on their experiences with the implementation of the curriculum. They would also like to have more and closer communication with their Regional Dissemination Centers.

The teachers who are beginning to implement the curriculum, have pointed out several positive changes in the teaching/learning culture of their schools. They are using new teaching strategies such as cooperative learning and manipulatives as well as new assessment strategies such as portfolios and comic strips. They are finding improvements in the grades, motivation, and attitudes of their students. They report less absenteeism among students and teachers since the beginning of the implementation of the Program.

They are seeing more meaningful teacher-student, teacher-teacher, teacher-director, and parent-teacher interactions in their schools. They are more motivated to continue developing professionally and would refuse to return to the traditional ways of teaching. They believe that the Regional Dissemination Centers and their Coordinators are very helpful since the Coordinators are always willing to "go out of their way" to provide assistance.

The responses of the second generation teachers and of the directors of their schools coincide in terms of the impact of the Program's implementation, the changes in the schools' teaching/learning culture, and the working relationship with the Regional Dissemination Centers. The only differences in responses lie in specific areas pertaining their main responsibilities within their schools.

The classroom visits to the first and second generation seventh grade teachers indicated similar levels of professional development. These visits were conducted by the curricular and assessment staffs who are university recognized leaders in curricular transformations versed in the NCTM and NRC standards and outstanding Science and Mathematics teachers. The experts found that the majority of the teachers are successfully implementing the new curriculum with only minor difficulties. Nevertheless, they also found that some teachers had difficulties unlearning the traditional paradigm and needed time to feel comfortable implementing the new curriculum.

In these visits, the experts also documented the changes in

the teaching/learning culture of the schools. They found that: (1) the teachers' attitudes towards Science and Mathematics had become more positive; (2) the teachers believe that all students can learn; (3) the teachers see themselves as facilitators and the students as the center of the teaching-learning process; (4) the teachers expect all students to succeed; and (5) the teachers are using the principles of constructivism and include the discovery approach and manipulatives, effectively. They also documented changes in the students such as more positive attitudes towards Science and Mathematics, students working in cooperative groups, and students becoming active learners.

The experts also reported that the first and second generation seventh grade teachers were frequently using cooperative learning groups in their classrooms. They were also using portfolios, comic strips, and reflexive diaries among other authentic assessment strategies. Both groups of teachers still request more assistance with assessment. These results are consistent with the information obtained through the semi-structured interviews regarding use of materials, strategies, and techniques.

The previously presented results highlight the changes occurring in the teaching/learning culture of the schools as a result of the whole-school intervention strategy implemented through the Regional Dissemination Centers. The key role of the empowered teacher to disseminate the reform is emphasized.

Table 8 presents the mean scores in the Teacher Empowerment Questionnaire of first and second generation seventh grade teachers

as well as of those of a sample of the leaders of the Teacher Enhancement Activities. The table also presents the comparison between those scores using t-tests. No significant differences in level of teacher empowerment were found between first and second generation seventh grade teachers. Thus, the teacher enhancement activities are being equally effective across generations of teachers who are transforming their schools into communities of learners who learn on their own.

Significant differences in level of teacher empowerment were found between the leaders and the first and second generation seventh grade teachers. Although the selection of the leaders was independent of the results of the Teacher Empowerment Questionnaire, it is significant that the most empowered teachers were selected by independent means to become leaders.

Discussion

Transforming the former pilot schools into Regional Dissemination Centers is presented as an effective strategy for scaling up educational reform. An essential element of this transfomation was an overall monitoring system. The success of the Regional Dissemination Centers in achieving their goals underscores the importance of developing models to disseminate educational reform based on partnerships between university faculty members and experienced teachers. There is clear evidence of the importance of collegiality and teamwork when designing and conducting teacher enhancement activities as well as of providing assistance in the implementation of the reform to promote and sustain change in the teaching/learning culture of the schools.

Partnerships between University Faculty Members and Experienced Teachers

The leaders of the training activities expressed high levels of satisfaction with their participation in the Teacher Enhancement Activities and with their recently established collaborations. They developed a heightened awareness of their professional development assets and needs. Together, they integrated theory and practice as Shanker (1993) suggests and worked in a collegial atmosphere as teams (Little, 1193; Regional Laboratory, 1987; Sparks & Loucks-Horsley, 1989) learning together as they learned from each other. These partnerships also promoted a better understanding of the SSI and of the educational reform efforts because the leaders reinforced through practice what they would share with the incoming

teachers.

The second generation seventh grade teachers benefitted from the interaction with experienced intermediate level teachers who had already implemented the curriculum while the senior high school teachers and the university faculty members helped them to develop a deeper understanding of specific subject matters and of educational and assessment strategies (Price, 1993). These teachers became thoroughly engaged in the teacher enhancement activities where they had direct contact with the curriculum in a supportive atmosphere where experimentation and learning were encouraged (Regional Laboratory, 1987; Sparks & Loucks-Horsley, 1989).

Contributing Factors to the Success/Limitations of the PR-SSI's Assisted - Peer Dissemination Strategy:

Several factors have contributed to the success of the assisted-peer dissemination strategy. However, there is also a need for improvement in other areas.

The design of the assisted-peer dissemination strategy takes into consideration the context where the dissemination of the Program is taking place (Little, 1993; Price, 1993; Regional Laboratory, 1987; Sparks & Loucks-Horsley, 1989). Identifying local resources in the seven educational regions was crucial for working with the particular needs of the teachers within each region while simultaneously working towards the goals of the Program (Price, 1993; Regional Laboratory, 1987; Sparks & Loucks-Horsley, 1989).

Establishing partnerships between university faculty members, high school teachers, and experienced intermediate level teachers

strengthened the teacher enhancement activities in terms of content and strategies. Designing the teacher enhancement activities in collaboration with SSI staff contributed to maintain the quality of these across Centers as the high levels of satisfaction with the activities indicated. Allowing the teachers to experiment directly with the curricular and assessment activities promoted their self-confidence in implementing the educational reform. Providing additional training and assistance to the staff of each RDC contributed to empower their leadership and to motivate them to implement the reform.

The prevalence of the traditional teaching paradigm has been a difficulty in the dissemination of the reform. Helping the second generation seventh grade teachers to change their way of teaching and assessing has required intensive work from the Coordinators just as it did from the curricular development and assessment staff in the pilot phase. The geographical distance between some Centers and their respective schools has some times limited the communication between the Centers and the schools thus delaying their access to materials, resources, and support.

Relationship between Teachers' Empowerment and their Effectiveness as Disseminators

The results of the study clearly indicated higher level of empowerment among the leaders of the Teacher Enhancement Activities than among the first and second generation seventh grade teachers. These results highlight the importance of the SSI leadership's identification and selection of teachers for their role as leaders

of Teacher Enhancement Activities. The Teacher Empowerment Questionnaire provided an independent means to further evidence the level of empowerment of these teachers.

As stated before, the high levels of satisfaction of the second generation seventh grade teachers with the Summer and Follow-Up Teacher Enhancement Activities support the importance of the empowered teacher as a disseminator and a change agent. Specifically, the teachers highlighted the leaders' mastery of content and availability to address questions and concerns; these two issues are highly related to the leaders' sense of ownership of the teaching experience and to their sense of empowerment. Thus, the leaders modelled the behavior and attitudes expected from the second generation teachers just as the curricular development and assessment staff did for the first generation teachers from the intermediate pilot schools. These findings support that empowerment is a key issue in the selection leaders for Teacher Enhancement Activities.

The Coordinators of the Regional Dissemination Centers are playing a central role in the dissemination of the educational reform. As leaders, they closely monitor the implementation of the Program in the second generation schools. This support and assistance is acknowledged by the teachers who see the Coordinators as role models, by the directors who see them as facilitators, and by the SSI staff who see them as leaders. Because the Coordinators are highly empowered intermediate level teachers, these results emphasize the strong relationship between the teachers' empowerment

and their effectiveness as disseminators.

Comparison of the Level of Professional Development of the First and Second Generation Seventh Grade Teachers

The level of professional development of the first and second generation seventh grade teachers based on classroom observations presents many similarities. The majority of the teachers from both groups were implementing the curriculum successfully. However, both groups are also facing similar difficulties in terms of shifting away from the traditional teaching paradigm and of the initial resistance of the students to change. Teachers from both groups request more assistance with cooperative learning and with authentic assessment.

The results of the semi-structured interviews with the second generation teachers and of the classroom visits highlighted several issues related to teacher empowerment. The self-awareness among these teachers who are beginning to implement the reform and who will become its leaders for the third generation of schools is critical for their professional growth as it was for the first generation of teachers. For example, they request a common class preparation period, they provide input for curricular revision, they create new curricular activities, and they are monitoring and self-assessing their own classroom practices.

The levels of professional development of the second generation teachers are a direct result of the interventions of the staff of the Regional Dissemination Centers. The strengths of the staff have been documented by external evaluators for the SSI who

have visited the Teacher Enhancement Activities such as Flores (1994) who stated:

> "It was impressive to see how providers with such different backgrounds were equally effective, using hands-on activities and fostering discourse. It was impossible for me to guess whether the provider was a teacher who had tried out the materials in classrooms, a professor of methods at the college of education, or a professor of content at the college of sciences just by looking at the way the activity was conducted. (p.11)"

Another criteria for effectiveness of Teacher Enhancement Activities is student performance. The measures of student performance from the intermediate pilot schools showed significant gains among the students participating in the Program. In the pre/post tests designed by the Program's assessment staff for value-added by the curriculum, the students showed average gains of one and a half points in a five-point scale rubric of authentic assessment. In the translated version of the NAEP test, done by ETS with PR-SSI staff, the students from PR-SSI schools showed scored seven points higher than those of other public schools. Even though all the data pertaining student performance among second generation students has not been collected, preliminary results suggest that the results will be similar thus confirming that the quality of the Teacher Enhancement Activities has been maintained.

The participation of the Coordinators has been a major contributing factor in the professional development of second

generation teachers since they designed the Teacher Enhancement Activities and conduct follow-up visits to these teachers. In coordination with the staff of the SSI, the Coordinators have played a significant role in designing and implementing a close monitoring system of the dissemination process where mid-course corrections have been made as a result of their input.

Importance of Promoting Changes in the School's Teaching/Learning culture through Whole-School Interventions

The high levels of agreement between the teachers and the directors from the second generation schools in terms of changes in the schools are congruent with other findings previously reported. These findings are also corroborated by the SSI staff, the RDC Coordinators, and the external evaluators. These results were also reported in similar interviews and observations conducted in the intermediate pilot schools (first generation schools) (Puerto Rico Statewide Systemic Initiative, Annual Report 1993-94, 1994).

The ongoing changes in the second generation schools such as the attitudes of parents, teachers, directors, and students as well as their vision, expectations, values, beliefs, and materials reflect changes in the teaching/learning culture of the schools as previously described in the sociological literature (Chinoy & Hewitt, 1975; Federico, 1975; Remmling & Campbell, 1970). These transformations are the result of shifts in the vision among some educators that changes to achieve high quality education must be directed towards working with the school as a whole or as a community of learners (Loucks-Horsley, 1994; Shanker, 1990) instead

of working only with sectors of the community such as teachers, directors, or students is to be achieved.

The differences in the school environment in these second generation schools can be attributed to the whole-school intervention strategy designed by the SSI and promoted by the Regional Dissemination Centers and their coordinators. Providing a constructivist curriculum, including all the seventh grade teachers from each school in the Teacher Enhancement Activities, offerring continued education to these teachers, fostering full involvement of administrators and changes in management styles, and promoting collegiality in the schools have led to the significant changes in attitudes and values in those schools. These results underscore the importance of introducing these innovations simultaneously if the objective is to change the teaching/learning culture of the schools.

Importance of Conceptualizing and Testing Change at a Pilot Stage before Scaling-Up

The success of the assisted-peer dissemination strategy is directly related to the pilot phase of the educational reform. With a small number of schools, the SSI staff addressed situations directly and revised the Program accordingly. After learning from the experience of implementing the curriculum, the SSI identified the strengths and weaknesses of the Program and made the necessary corrections before beginning the dissemination process.

The comparable levels of professional development and teacher empowerment among first and second generation teachers are evidence

of consistent quality across implementation phases. The similarities in the transformations in school teaching/learning culture across implementation phases are evidence of the sustainability of change when empowered teachers are the change agents. The empowerment of the second generation teachers will provide the leadership and energy to assure the continuation of the educational reform through successive generations in the scaling-up process.

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Norma Dávila; Department of Psychology, University of Puerto Rico, Río Piedras; Manuel Gómez, Puerto Rico Statewide Systemic Initiative.

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Correspondence concerning this article should be addressed to Norma Dávila, Resource Center for Science and Engineering, P.O. Box 23334, San Juan, PR 00919-3334.

Appendix A

Guide Questions for Semi-Structured Interviews

Guide Questions for Semi-Structured Interviews with University Faculty Members, High School Teachers, Experienced Intermediate Level Teachers, and Regional Dissemination Center Coordinators

1. How did you feel about the upcoming Summer? (Ask about the reactions towards the new managerial responsibilities of the Coordinators and about their expectations of their role within the curricular reform.)
2. How did you feel when you learned that you would be working as part of a team?
3. How would you describe your experience working with teachers from different levels? (Refers to university faculty members working with high school teachers and/or experienced intermediate level teachers.)
4. How has your vision of the SSI changed since you began to work in it?
5. How has your vision of Science and Mathematics teaching changed since you began to work in the SSI?
6. How did your experience with the Summer Teacher Enhancement Activities contribute to your professional development? What were the best aspects of the experience and which ones could be improved?
7. Which were the most useful aspects of the "Training for Trainers" retreat for your work during the Summer Teacher Enhancement Activities? Which were the least useful?

8. If you could change something about the Summer Teacher Enhancement Activities, what would it be ? Why and how would you change it?

9. Would you be available to continue working in the SSI? What role would you like to play?

Guide Questions for Follow-Up Interviews with Intermediate Level Teachers

1. What changes have been taking place at the school level since the Program was implemented?

2. What difficulties are you facing with the implementation of the Program?

3. How are the students responding to the new curriculum? What changes have you noticed?

4. How has been your experience with the teacher enhancement activities? What changes have you made in your teaching and assessment practices since you began to participate in them?

5. How has been your experience with the curricular units or blocks? What changes or modifications have you made to improve them? What suggestions can you offer to improve or revise the blocks?

6. How has been your experience with the materials?

7. How are the parents responding to the Program? Have they approached you in any way?

Guide Questions for Interviews with Intermediate Level School Directors

1. How do you feel implementing the PR-SSI's curriculum?
2. How has been your experience implementing the curriculum?
3. As a school director, what difficulties have you faced implementing the curriculum in your school?
4. Which areas of the Program should be getting more attention?
5. What changes are taking place in your school as a result of the Program?
6. How are the parents responding to the Program?
7. How are the students responding to the new curriculum?
8. How has been your experience with the Regional Dissemination Center and its coordinator?
9. What do you think will be the long-term impact of the Program in your school?
10. Additional comments or suggestions.

Appendix B

Classroom Observation Guide, Original and Translated Versions

Translated Items of Teacher Empowerment Questionnaire

PR-SSI
Guía de Observaciones en las Visitas de Apoyo al Salón de Clases
Currículo K-9

Protocolo de Observaciones

Introducción:

El propósito de esta Guía de Observaciones es facilitar y estandarizar el proceso de visitas al salón de clases para proveer retroalimentación a los maestros que están implantando el currículo del Programa PR-SSI. De esta manera, el equipo de evaluación del PR-SSI podrá documentar con mayor efectividad el progreso y los cambios en la forma de enseñar y avaluar de los maestros participantes.

La Guía está diseñada para describir y documentar los eventos y las interacciones que ocurren en el salón de clases cuyo desarrollo dependerá de múltiples factores. Se entiende que cada salón de clases presentará unas características particulares y que una lección podrá ser enfocada de múltiples maneras dentro de la flexibilidad que provee el currículo.

Se solicita a los/las observadores(as) que utilicen los siguientes criterios para dirigiir sus discusiones con los/las maestros(as) en las escuelas que visiten. Se espera que los/las maestros(as) hayan realizado su propia autoevaluación y que aprovechen la oportunidad para aclarar dudas y obtener retroalimentación pues habrán recibido copias de los criterios con anticipación. Al finalizar la reunión con el/la maestro(a) y regresar a su oficina, el/la observador(a) redactará un informe narrativo en el cual no aparecerá referencia directa a los criterios que se incluyen. Este informe se entregará a la directora del equipo de evaluación del PR-SSI y deberá incluir la siguiente información en una hoja aparte: (1) fecha de la visita; (2) escuela; (3) maestro(a); (5) disciplina o materia; (6) grado; (7) lección/actividad observada; (8) período de observación; (8) observador(a) para efectos de documentación.

Se solicita el insumo de los/las observadores(as) para revisiones futuras del instrumento. Muchas gracias por su acostumbrada cooperación.

Adaptada de: Classroom Observation Form (Winters, 1994, AERA Handout)

Descripción de los criterios:

I. Rol del/la estudiante:

Se refiere a las diferentes formas de participación en el proceso de enseñanza-aprendizaje de los/las estudiantes.

II. Participación de los/las estudiantes:

Se desea auscultar el nivel de participación de los/las estudiantes a través de la lección.

III. Incorporación y procesamiento de material

Describe cómo los estudiantes incorporan y procesan el material que se está presentando en clases.

IV. Rol del/la maestro(a):

Se refiere a las diferentes formas de llevar una clase que se pueden utilizar en una lección individualmente o en conjunto en el transcurso de la misma.

V. Estilo de retroalimentación del/la maestro(a):

Este criterio se refiere a la forma en que el/la maestro(a) reacciona a las respuestas y comentarios de los/las estudiantes.

VI. Estrategias y técnicas de enseñanza y avaluación:

Presenta una serie de estrategias y técnicas que se pueden utilizar en el salón de clases en estos procesos. La siguiente lista presenta algunas alternativas que puede utilizar el/la maestro(a). En caso de que se esté utilizando alguna estrategia ó técnica que no aparezca en la lista, favor de incluirlo en sus comentarios.

a. Utiliza
   1. manipulativos:.....
   2. proyector vertical:.....
   3. diapositivas:.....
   4. calculadora:.....
   5. otros audiovisuales
      (especifique): _____
      _____

b. Utiliza técnicas innovadoras de enseñanza
   1. aprendizaje cooperativo:.....

2. método de descubrimiento: .....
3. laboratorios: .....
4. representación de roles: .....
5. simulación: .....
6. otros (especifique): _____

_____

c. Utiliza técnicas innovadoras de "assessment" o avaluación auténtica
1. tirillas cómicas: .....
2. portafolios: .....
3. preguntas abiertas: .....
4. diario reflexivo: .....
5. pruebas de ejecución: .....
6. otros (especifique): _____

_____

d. Utiliza ejemplos de la vida diaria (provea algunos):

VII. Utilización del conocimiento previo de los/las estudiantes en la lección/actividad:

Se espera auscultar si los/las maestros(as) incluyen en las clases tanto el conocimiento como las experiencias previas de los/las estudiantes.

VIII. Evidencia de integración:

Este criterio busca evidencia del nivel de integración que se está fomentando en los salones de clases dentro de las disciplinas (ej., Ciencias Terrestres y Física) y entre las disciplinas (ej., Ciencias y Matemáticas).

IX. Logro de objetivos de la lección/actividad:

Este criterio se refiere a si se cumplieron los objetivos de la lección/actividad. Favor de incluir comentarios sobre elementos que contribuyeron a cumplir/no cumplir los objetivos.

X. Areas de interés especial identificadas por el/la maestro(a):

Como parte del proceso de retroalimentación a los/las maestros(as) se espera que ellos(as) identifiquen aquellas áreas en las que les gustaría mejorar y aquéllas que les gustaría reforzar mediante asistencia individual y mediante talleres específicos. Este espacio fue diseñado para que se documenten estas áreas según identificadas.

XI. Observaciones generales y comentarios:

Este espacio está diseñado para hacer anotaciones generales y comentarios en torno a la visita al salón de clases.

Hoja de Información de las Visitas de Apoyo al Salón de Clases

Fecha de la visita: _____

Escuela: _____

Maestro(a): _____

Disciplina o Materia: _____

Grado: _____

Lección/Actividad observada: _____

Período de Observación: _____

Observador(a): _____

Guía de Observaciones en las Visitas de Apoyo a los/las Maestros(as) en el Salón de Clases

A continuación se presentan una serie de criterios que deben guiar su discusión con el/la maestro(a) a quien estaba visitando.

I. Rol del/la estudiante.

II. Participación de los/las estudiantes.

III. Incorporación y procesamiento de material.

IV. Rol del/la maestro(a).

V. Estilo de retroalimentación del/la maestro(a).

VI. Estrategias y técnicas de enseñanza y avaluación.

VII. Utilización del conocimiento previo de los/las estudiantes en la lección/actividad.

VIII. Evidencia de integración.

IX. Logro de objetivos de la lección/actividad.

X. Areas de interés especial identificadas por el/la maestro(a).

XI. Observaciones generales y comentarios.

PR-SSI
K-9 Curriculum
Classroom Observation Guide

Observation Protocol

Introduction:

The purpose of this Classroom Observation Guide is to facilitate and standardize the classroom observation process designed to offer constructive feedback to the teachers who are implementing the PR-SSI's curriculum. In this way, the evaluation team of the PR-SSI will be able to document progress and changes in teaching and assessment among the Program's participating teachers more effectively.

The Guide is designed to describe and document the events and interactions ocurring in the classroom which are known to be affected by multiple factors. It is understood that each classroom will be unique and that each lesson can be taught in many different ways within the flexibility provided by the curriculum.

The following criteria are presented to the observers as a guide to direct the discussions about their observations with the teachers. Teachers are expected to conduct their own self-assessment prior to the classroom visit to benefit more from an open exchange of ideas and feedback with the observer because they received the criteria before the visit. After the meeting with the teacher ends and the observer returns to his/her office, s/he will prepare a report in which the criteria will not be addressed directly in the text (e.g., without subheadings). The director of the evaluation component will receive this report which will contain the following information on a separate cover sheet for documentation purposes: (1) date of visit; (2) school; (3) teacher; (4) discipline or subject area; (5) grade; (6) lesson or activity observed; (7) duration of the observation; (8) observer. It is understood that the report and the cover sheet will be separated upon receipt for confidentiality reasons.

The observers' input in future revisions of this instrument will be greatly appreciated. Thank you very much for your cooperation.

Adapted from: Classroom Observation Form (Winters, 1994, AERA Handout)

Description of the Criteria

I. Role of the student

Refers to the different ways in which students can participate in the teaching-learning process.

II. Participation of the student

Addresses the level of participation of the students throughout the lesson.

III. Processing of content

Describes how the students process the content of the lesson.

IV. Role of the teacher

Refers to the different ways which can be used to carry out a lesson by the teacher.

V. Feedback style of the teacher

Refers to how the teacher responds and reacts to the students' answers and comments.

VI. Teaching and assessment strategies and techniques

This criterion presents a series of strategies and techniques which can be used in the classroom for teaching and assessment purposes; the following list presents some of the options available to the teacher. Please add any strategies or techniques being used yet not included in the list.

a. Use of:
   1. manipulatives
   2. overhead projector
   3. slides
   4. calculator
   5. other audiovisual aids (please specify)

b. Innovative teaching techniques
   1. cooperative learning
   2. discovery approach
   3. laboratories
   4. role play
   5. simulations
   6. other (please specify)

c. Innovative assessment or authentic assessment techniques
   1. comic strips
   2. portfolios
   3. open-ended questions
   4. reflexive diaries
   5. performance tests
   6. other (please specify)

d. Use of examples from daily life experiences

VII. Use of the students' prior knowledge in the lesson/activity.

Addresses the teachers' use of the students' prior knowledge and experiences within the lesson/activity to increase its relevance to their lives.

VIII. Evidence of integration

Seeks evidence of integration within the disciplines (e.g., Earth Sciences and Physics) and between the disciplines (e.g., Science and Mathematics).

IX. Accomplishment of the objectives of the lesson/activity

Refers to whether the objectives of the lesson/activity were met. Please include comments about factors which could have contributed to either meeting or not meeting the objectives.

X. Areas of special interest as identified by the teacher

As part of the feedback process for the teachers, it is expected that they will identify specific areas of their performance which they would like to improve as well as those areas which they would like to strengthen through workshops and trainings as well as individual assistance. Please refer to those areas as expressed by the teacher.

XI. General observations and comments

Please provide any general observations or comments related to the classroom visit.

Classroom Observation Guide

The following criteria should direct your discussion of your classroom observation with the teacher.

I. Role of the student

II. Participation of the student

III. Processing of content

IV. Role of the teacher

V. Feedback style of the teacher

VI. Teaching and assessment strategies and techniques

VII. Use of the students' prior knowledge in the lesson/activity

VIII. Evidence of integration

IX. Accomplishment of the objectives of the lesson/activity

X. Areas of special interest as identified by the teacher

XI. General observations and comments

Teacher Empowerment Questionnaire: Translated Items

1. I have had the opportunity to monitor programs.
2. I work in a professional environment.
3. I am respected as a professional in my school.
4. I am motivated to look for additional information in my area according to the needs of my students.
5. I can make decisions about the curriculum.
6. I see myself as someone who makes decisions about the implantation of new programs and educational projects in the school.
7. I can make decisions about the implantation of new programs and educational projects in the school.
8. I am receiving respect and support from my colleagues.
9. I believe that I am contributing to help the students to become independent learners.
10. I am motivated to adapt the curriculum.
11. I am motivated to foster educational change.
12. I can make decisions about the selection of teachers for the school.
13. I have the opportunity to grow professionally.
14. I have control over the content and teaching in my classes.
15. I see myself as an effective role model for my students.
16. I have a strong knowledge base in my area.

17. I am fostering the integration of knowledge from various disciplines by my students.
18. I participate in budget decisions in my school.
19. I am motivated to keep myself up to date in my discipline.
20. I am requested to train other teachers in my area of expertise.
21. I believe that I am contributing to empower my students.
22. I am motivated to go to work on a regular basis.
23. I understand that my work in the classroom has an impact on my school's community.
24. I have had the opportunity to train other teachers in my school about innovative teaching and assessment strategies.
25. I have the opportunity to take continued education courses.
26. I am very committed to an important educational program for my students.
27. I can choose the method which I will use to teach my students.
28. I participate in the professional development of my school's staff.
29. I can choose my own class schedule.
30. I am motivated to ask my colleagues for advice and information when I need them.
31. I am seeing the students make academic progress.
32. I believe that I have the ability to complete planned tasks.

33. Principals, teachers, and other school personnel ask for my advice regarding various issues related to the school.
34. I have the opportunity to collaborate with my colleagues in professional development activities.
35. I believe that I have the opportunity to influence others.
36. Other people in the school ask for my advice.
37. I am motivated to stimulate my colleagues to grow professionally.
38. I am fostering leadership skills among my colleagues.
39. Students are the first priority in my school.
40. I believe that I am having an impact on other teachers and on the students.
41. I am qualified to serve as a resource for the professional development of my colleagues.
42. I participate in the dissemination efforts of the curriculum and teaching strategies.
43. I am fostering leadership skills among my students.
44. I hardly rely on a textbook to teach my classes.
45. I am very comfortable implementing the curriculum.

Table 1

Main Elements that Contribute to Successful Professional Development Programs according to Recent Literature

Element	Source
High priority	Sparks and Loucks-Horsley, 1989
Consideration of context	Little, 1993; Price, 1993; Regional Laboratory, 1987*; Sparks and Loucks-Horsley, 1989
Support from state and district administrators	Sparks and Loucks-Horsley, 1989
Shared decision-making	Price, 1993; Regional Laboratory, 1987
Balance in interests of individuals and institutions	Little, 1993; Regional Laboratory, 1987
Availability and effective use of materials and resources	Regional Laboratory, 1987; Sparks and Loucks-Horsley, 1989
Based on theory and other available knowledge	Price, 1993; Regional Laboratory, 1987
Preparation of teachers and students to use inquiry	Little, 1993
Practical activities	Regional Laboratory, 1993
Demonstration and modelling	Sparks and Loucks-Horsley, 1989
Instructional and assessment strategies	Price, 1993

Table 1 (Continued)

Main Elements that Contribute to Successful Professional Development Programs according to Recent Literature

Element	Source
Flexibility in scheduling and school organization	Price, 1993; Regional Laboratories, 1987
Opportunities for classroom experimentation	Regional Laboratory, 1987; Sparks and Loucks-Horsley, 1989
Opportunities for practice reflection	Regional Laboratory, 1987
Participation in goals	Price, 1993; Regional Laboratory, 1987; Sparks and Loucks-Horsley, 1989
Collegiality	Little, 1993; Regional Laboratory, 1987; Sparks and Loucks-Horsley, 1989
Engagement with ideas and materials	Little, 1993
Constructive feedback, monitoring, and discussion	Regional Laboratory, 1987; Sparks and Loucks-Horsley, 1989
Recognition	Regional Laboratory, 1987

Note. Regional Laboratory stands for the Regional Laboratory for Educational Improvement of the Northeast and the Islands.

Table 2

Mean Ratings of Evaluations of Sample Science Summer Teacher Enhancement Activities Across Regional Dissemination Centers: Hot or Cold Curricular Block: Organization and Logistics

	Centers						
	1	2	3	4	5	6	7
Items							
N =	10	16	12	10	20	11	11
1. Quality of presentation	4.0	3.8	3.8	2.8	3.6 **	3.4	3.4
2. Organization and sequence	3.9	3.7 **	3.6	2.8	3.7 **	3.6	3.1
3. Clarity of expression	4.0	3.9 **	3.8	2.8	3.7	3.6	3.5
4. Mastery of topic	3.8	3.8	3.9	3.3	3.7	3.6	3.6
5. Overall organization	3.9	3.8	3.7 *	2.9	3.4 *	3.7	3.1
6. Use of time	3.5	3.6 *	3.4 *	2.7	3.3 **	3.3	2.4
7. Participants' engagement	4.0	3.8	3.8	3.2	3.4	3.9	3.4
8. Overall evaluation	3.9	3.6	3.8	2.9	3.5	3.6	3.3

Note. The scale ranges from Outstanding = 4, Good = 3, Satisfactory = 2, to Poor = 1. * or ** represents different number of participants by Center as follows: # 2: * = 14 , ** = 15; # 3: * = 11; #4 * = 14; #5: * = 18, ** = 19.

Table 3

Mean Ratings of Evaluations of Sample Mathematics Summer Teacher Enhancement Activities Across Regional Dissemination Centers: Longitude Curricular Block: Organization and Logistics

Items	Centers						
	1	2	3	4	5	6	7
N =	12	15	17	14	13	22	13
1. Quality of presentation	3.3	3.9	3.9	3.2	4.0	3.4	3.7
2. Organization and sequence	3.3	3.9	3.7	2.9	3.7	3.5	3.5
3. Clarity of expression	3.3	3.9	3.8 *	3.1	3.9	3.2	3.2
4. Mastery of topic	3.7	3.9	4.0 *	3.3	3.9	3.5	3.8
5. Overall organization	3.4 *	3.9	3.6 *	2.9	3.8	3.5	3.3
6. Use of time	2.8	3.9	3.6	2.8	3.7	3.6	3.2
7. Participants' engagement	3.5	4.0	3.7	3.1	3.7	3.5	3.9
8. Overall evaluation	3.3	3.9	3.8	3.3	3.8	3.0 *	3.7

Note. The scale ranges from Outstanding = 4, Good = 3, Satisfactory = 2, to Poor = 1. * or ** represents different number of participants by Center as follows: #1 * = 11; #2 * = 16; #5 * = 20.

Table 4

Mean Ratings of Evaluations of Sample Science Summer Teacher Enhancement Activities Across Regional Dissemination Centers: Hot or Cold Curricular Block: Content and Strategies

		Centers						
Items		1	2	3	4	5	6	7
	N =	9	16	12	10	20	11	11
9. Activities allow for concept discovery		3.9	* 3.5	---	3.4	3.7	3.4	3.4
10. Activities were adequate for concept development		3.9	* 3.7	---	3.4	3.7	3.5	3.7
11. Instructors explained concepts adequately		4.0	* 3.9	3.9	3.1	3.4	3.5	3.5
12. Instructors used cooperative learning		3.9	3.9	3.8	3.6	** 3.5	3.9	3.7
13. Instructors were receptive to suggestions		3.7	3.4	3.8	2.9	** 3.9	* 3.7	3.7
14. Instructors were available to clarify doubts		3.9	3.8	3.9	3.1	* 3.7	4.0	3.8
15. Opportunity for curricular suggestions and changes		3.7	* 3.7	3.9	2.8	* 3.7	* 3.7	3.5
16. Opportunity to develop assessment activities		3.5	* 3.3	4.0	2.2	** 3.2	3.2	* 2.5
17. Opportunity for Science and Mathematics integration		3.9	3.6	3.8	3.0	** 3.7	3.5	3.5
18. Materials to develop the activities were adequate		3.9	3.8	3.0	** 3.4	* 3.7	3.7	3.5
19. Identification of supplementary activities and materials		3.7	3.6	3.5	* 3.3	* 3.7	* 3.7	** 3.4

Note. The scale for the Content and Strategies ranges from Very Much Agree = 4, Agree = 3, Disagree = 2, to Very Much Disagree = 1. * or ** represents different number of participants by Center as follows: # 2: * = 15; #4: * = 8, ** = 9; #5: * = 18, ** = 19, *** = 20; #5: * = 18, ** = 19; # 6: * = 10; and #7: * = 6, ** = 10.

Table 5

Mean Ratings of Evaluations of Sample Mathematics Summer Teacher Enhancement Activities Across Regional Dissemination Centers: Graphs Curricular Block: Content and Strategies

	Centers						
	1	2	3	4	5	6	7
Items	N = 12	15	17	14	13	22	13
9. Activities allow for concept discovery	3.6	3.9	___	3.5	3.6	3.6 *	3.6
10. Activities were adequate for concept development	3.5	3.9	___	3.3	3.7	3.7	3.5
11. Instructors explained concepts adequately	3.4	3.9	3.8	3.4	3.9	3.4	3.6
12. Instructors used cooperative learning	3.9	4.0	3.9	3.2	3.9	___	3.8
13. Instructors were receptive to suggestions	3.4	3.9	3.9	3.7	3.8 *	___	3.8
14. Instructors were available to clarify doubts	3.5	3.9	4.0	3.6	3.9	___	3.7
15. Opportunity for curricular suggestions and changes	3.3	3.9	3.8	3.6	3.9	___	3.5
16. Opportunity to develop assessment activities	3.6	3.6	3.9	2.8 **	3.3	___	3.5
17. Opportunity for Science and Mathematics integration	3.8	3.7	3.7	3.5 **	3.5	___	3.5
18. Materials to develop the activities were adequate	3.7	4.0 *	3.8 *	3.6	3.6	___	3.5
19. Identification of supplementary activities and materials	3.4	3.7	3.3	3.6 *	3.5	___	4.0

Note. The scale from Very Much Agree = 4, Agree = 3, Disagree = 2, to Very Much Disagree = 1. * or ** represents different number of participants by Center as follows: #2 * = 14; #3 * = 6; #4 * = 11, ** = 13.

Table 6

Mean Ratings of Evaluations by Science and Mathematics Teachers of Sample Follow-Up Teacher Enhancement Activities in Three Regional Dissemination Centers: Organization and Logistics

Items	Centers 1	2	3
N =	27	11	18
1. Quality of presentation	4.0	3.6	3.5
2. Organization and sequence	3.9	3.8	3.3
3. Clarity of expression	4.0	3.7	3.7
4. Mastery of topic	4.0	3.8	3.9
5. Overall organization	3.9	3.5	3.6
6. Use of time	3.9	3.3	3.3
7. Participants' engagement	3.8	3.7	3.4
8. Overall evaluation	3.6	3.7	3.4

Note. The scale ranges from Outstanding = 4, Good = 3, Satisfactory = 2, to Poor = 1.

Table 7

Mean Ratings of Evaluations by Science and Mathematics Teachers of Sample Follow-Up Teacher Enhancement Activities in Three Regional Dissemination Centers: Content and Strategies

	Centers		
	1	2	3
Items			
N =	26	11	17
9. Activities allow for concept discovery	4.0	3.3	* 3.6
10. Activities were adequate for concept development	..0	3.5	* 3.5
11. Instructors explained concepts adequately	4.0	3.4	3.6
12. Instructors used cooperative learning	3.8	3.7	3.8
13. Instructors were receptive to suggestions	3.8	3.5	3.8
14. Instructors were available to clarify doubts	4.0	3.8	3.8
15. Opportunity for curricular suggestions and changes	3.8	* 3.6	3.5
16. Opportunity to develop assessment activities	** 3.8	3.1	3.6
17. Opportunity for Science and Mathematics integration	* 3.6	3.4	3.6
18. Materials to develop the activities were adequate	*** 4.0	3.6	3.6
19. Identification of supplementary activities and materials	*** 3.8	3.4	3.5

Note. The scale for the Content and Strategies ranges from Very Much Agree = 4, Agree = 3, Disagree = 2, to Very Much Disagree = 1. * or ** represents different number of participants by Center as follows: #1: * = 23, ** = 24, *** = 25; #2: * = 10; # 3: * = 16.

Table 8

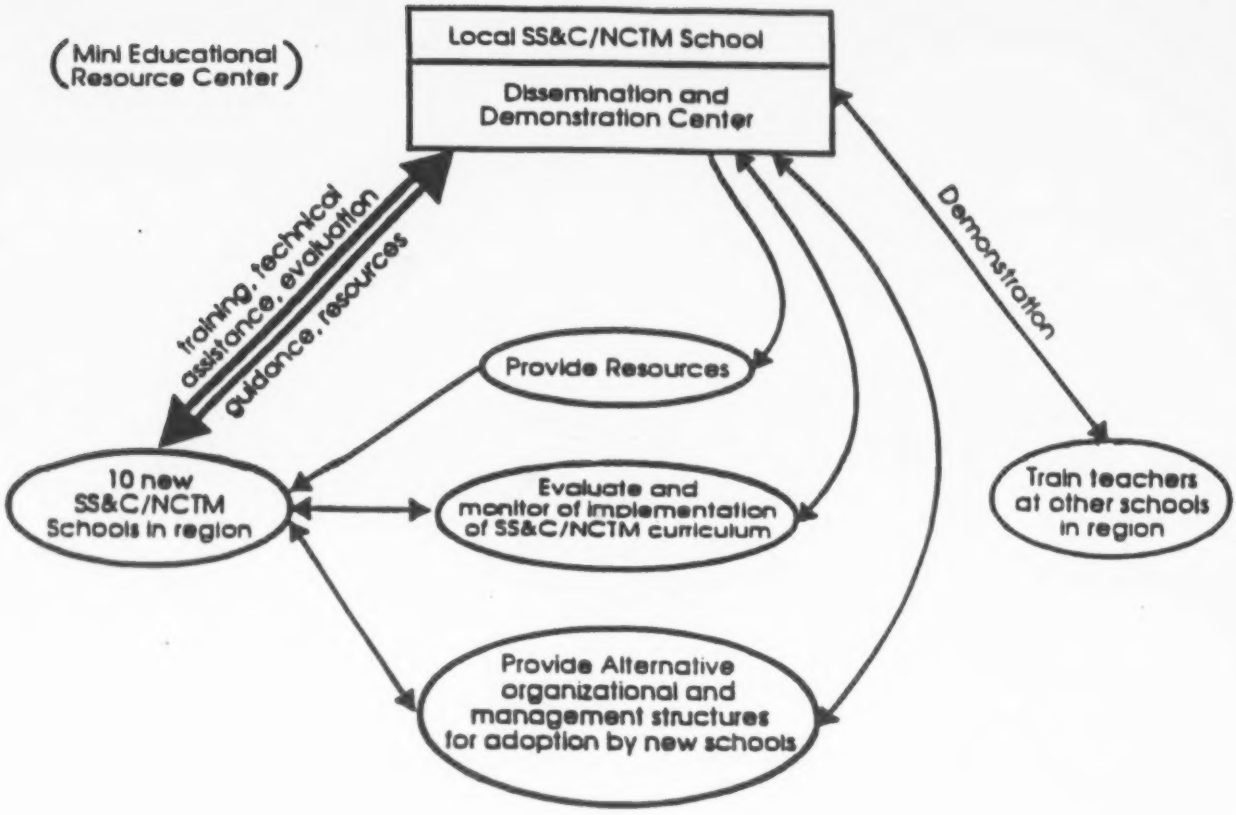
Comparison of Levels of Teacher Empowerment among First and Second Generation Seventh Grade Teachers and of a Sample of the Leaders of the Summer Teacher Enhancement Activities

	Leaders	First Generation	Second Generation
N	11	20	35
Mean Score	144.82	134.70	134.74
Standard Deviation	9.83	14.42	17.35
Degrees of Freedom	53	53	44
t-value	0.009*	2.070	1.827
Critical t	1.684	1.684	1.684

Note. * $p < 0.05$.

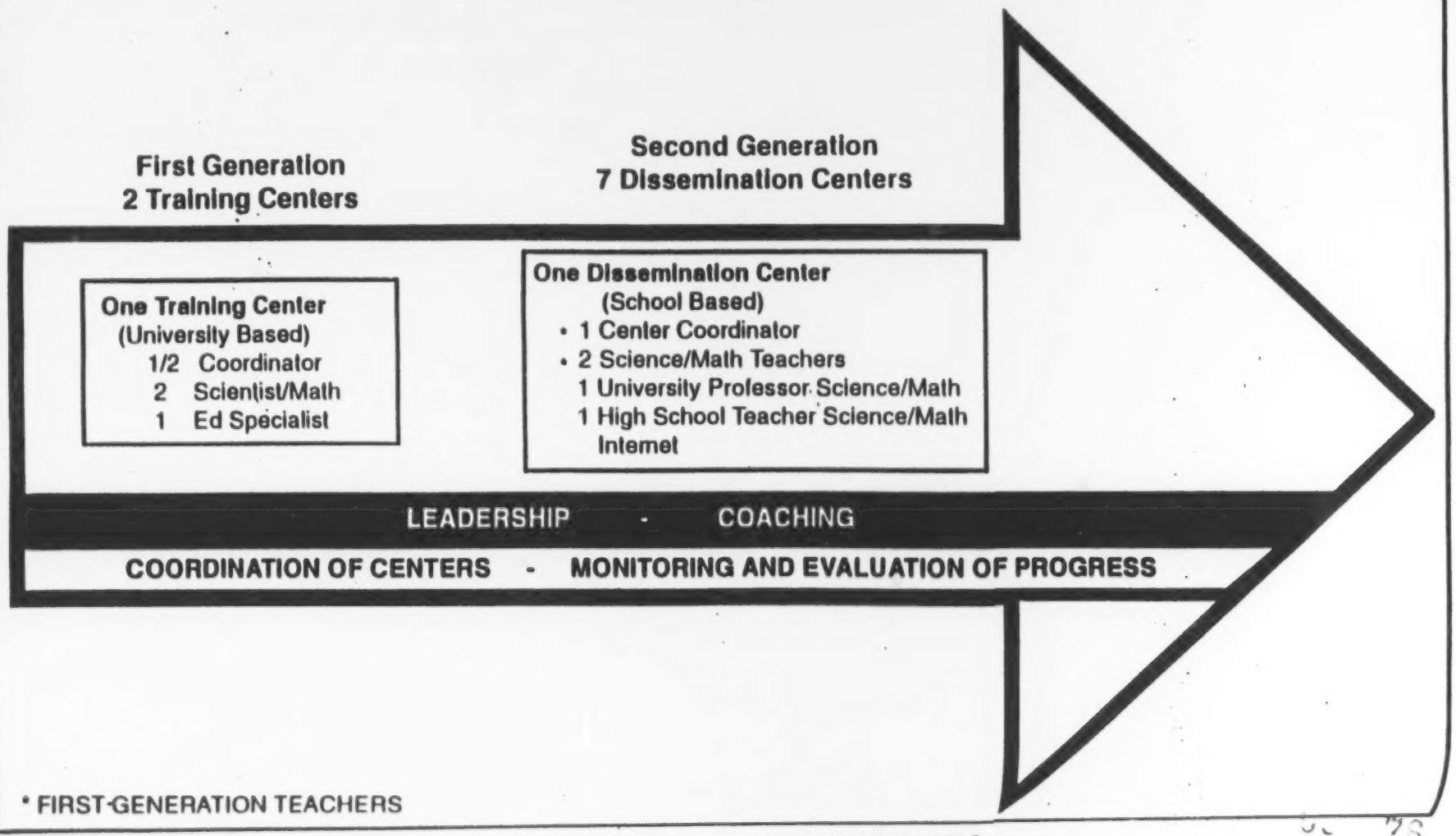
Figure 1

Dissemination and Demonstration Center


(Mini Educational Resource Center)
Local SS&C/NCTM School
Dissemination and Demonstration Center
training, technical assistance, evaluation
guidance, resources
Demonstration
Provide Resources
10 new SS&C/NCTM Schools in region
Evaluate and monitor of implementation of SS&C/NCTM curriculum
Train teachers at other schools in region
Provide Alternative organizational and management structures for adoption by new schools

BEST COPY AVAILABL

Dissemination of Reform
Maintaining Quality



* FIRST-GENERATION TEACHERS

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